PALM Intranet

Application Number [ ] Submit

IDS Flag Clearance for Application 10823273

IDS Information

Content	Mailroom Date	Entry Number	IDS Review	Last Modified	Reviewer
M844	2004-05-07	12	Y ☑	2006-02-27 13:03:12.0	BShrivastav
M844	2004-04-12	10	Y ☑	2006-02-27 13:03:11.0	BShrivastav

Update

Refine Search

Search Results -

Term	Documents
@PD	37922541
(13 AND (@PD > "20061027")).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0
(L13 AND @PD > 20061027).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L14

Refine Search

Recall Text Clear Interrupt

Search History

DATE: Friday, October 27, 2006 Purge Queries Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L14	L13 and @pd > 20061027	0	L14
L13	L12 and HTSC	6	L13
L12	L11 and (substrate or dielectric or (thin adj film))	218	L12
L11	L10 and (resonator or antenna or coil or receiver or detector)	258	L11
L10	L9 and L8	266	L10
L9	(High adj temperature adj superconductor) or HTC	6871	L9
	(324/300 |324/301 |324/302 |324/303 |324/304 |324/305 |324/306 |324/307 |324/308 |324/309 |324/310 |324/311 |324/312 |324/313 |324/314 |324/315 |324/316 |324/317 |324/318 |324/319 |324/320 |324/321 |324/322 or 333/202		

L8	|333/203 |333/204 |333/205 |333/206 |333/207 |333/208 |333/209 |333/210 |333/211 |333/212 |333/24C |333/213 |333/214 |333/215 |333/216 |333/217 |333/81R |333/81A |333/81B |333/218 |333/219 |333/219.1 |333/219.2 |333/220 |333/221 |333/222 |333/223 |333/224 |333/225 |333/226 |333/227 |333/228 |333/229 |333/230 |333/231 |333/232 |333/233 |333/234 |333/235 |333/236 |333/237 |333/238 |333/239 |333/240 |333/241 |333/242 |333/243 |333/244 |333/245 |333/246).ccls.	27810	L8
L7	(324/300 |324/301 |324/302 |324/303 |324/304 |324/305 |324/306 |324/307 |324/308 |324/309 |324/310 |324/311 |324/312 |324/313 |324/314 |324/315 |324/316 |324/317 |324/318 |324/319 |324/320 |324/321 |324/322 or 333/202 |333/203 |333/204 |333/205 |333/206 |333/207 |333/208 |333/209 |333/210 |333/211 |333/212 |333/24C |333/213 |333/214 |333/215 |333/216 |333/217 |333/81R |333/81A |333/81B |333/218 |333/219 |333/219.1 |333/219.2 |333/220 |333/221 |333/222 |333/223 |333/224 |333/225 |333/226 |333/227 |333/228 |333/229 |333/230 |333/231 |333/232 |333/233 |333/234 |333/235 |333/236 |333/237 |333/238 |333/239 |333/240 |333/241 |333/242 |333/243 |333/244 |333/245 |333/246).ccls.	27810	L7
L6	L5 and HTSC	6	L6
L5	L4 and (substrate or dielectric or (thin adj film))	218	L5
L4	L3 and (resonator or antenna or coil or receiver or detector)	258	L4
L3	L2 and L1	266	L3
L2	(High adj temperature adj superconductor) or HTC	6871	L2
L1	(324/300-322 or 333/202-246).ccls.	27810	L1

END OF SEARCH HISTORY

Create A Case

Select?	Database	Query	Plural	Op	Thesaurus	Set Name
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	(324/300-322 or 333/202-246).ccls.	YES	ADJ		L1
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	(High adj temperature adj superconductor) or HTC	YES	ADJ		L2
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L2 and L1	YES	ADJ		L3
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L3 and (resonator or antenna or coil or receiver or detector)	YES	ADJ		L4
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L4 and (substrate or dielectric or (thin adj film))	YES	ADJ		L5
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L5 and HTSC	YES	ADJ		L6
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	(324/300 |324/301 |324/302 |324/303 |324/304 |324/305 |324/306 |324/307 |324/308 |324/309 |324/310 |324/311 |324/312 |324/313 |324/314 |324/315 |324/316 |324/317 |324/318 |324/319 |324/320 |324/321 |324/322 or 333/202 |333/203 |333/204 |333/205 |333/206 |333/207 |333/208 |333/209 |333/210 |333/211 |333/212 |333/24C |333/213 |333/214 |333/215 |333/216 |333/217 |333/81R |333/81A |333/81B |333/218 |333/219 |333/219.1 |333/219.2 |333/220 |333/221 |333/222 |333/223 |333/224 |333/225 |333/226 |333/227 |333/228 |333/229 |333/230	YES	ADJ		L7

		|333/231 |333/232 |333/233 |333/234 |333/235 |333/236 |333/237 |333/238 |333/239 |333/240 |333/241 |333/242 |333/243 |333/244 |333/245 |333/246).ccls. (324/300 |324/301 |324/302 |324/303 |324/304 |324/305 |324/306 |324/307 |324/308 |324/309 |324/310 |324/311 |324/312 |324/313 |324/314 |324/315 |324/316 |324/317 |324/318 |324/319 |324/320 |324/321 |324/322 or 333/202 |333/203 |333/204 |333/205 |333/206 |333/207 |333/208 |333/209 |333/210 |333/211 |333/212 |333/24C |333/213 |333/214 |333/215 |333/216 |333/217 |333/81R |333/81A |333/81B |333/218 |333/219 |333/219.1 |333/219.2 |333/220 |333/221 |333/222 |333/223 |333/224 |333/225 |333/226 |333/227 |333/228 |333/229 |333/230 |333/231 |333/232 |333/233 |333/234 |333/235 |333/236 |333/237 |333/238 |333/239 |333/240 |333/241 |333/242 |333/243 |333/244 |333/245 |333/246).ccls.			
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	(High adj temperature adj superconductor) or HTC	YES	ADJ	L9

☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L9 and L8	YES	ADJ	L10
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L10 and (resonator or antenna or coil or receiver or detector)	YES	ADJ	L11
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L11 and (substrate or dielectric or (thin adj film))	YES	ADJ	L12
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L12 and HTSC	YES	ADJ	L13
☑	PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD	L13 and @pd > 20061027	YES	ADJ	L14

Please enter the case name: 823_273_10

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Rules for naming Cases

- Case names can only contain alphanumeric characters including underscore (_).
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Hit List

First Hit | Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 5721194 A Relevance Rank: 68

L6: Entry 6 of 6 File: USPT Feb 24, 1998

US-PAT-NO: 5721194
DOCUMENT-IDENTIFIER: US 5721194 A
**** See image for Certificate of Correction ****

TITLE: Tuneable microwave devices including fringe effect capacitor incorporating ferroelectric films

DATE-ISSUED: February 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yandrofski; Robert M.	Littleton	CO		
Price; John Charles	Boulder	CO		
Barnes; Frank	Boulder	CO		
Hermann; Allen M.	Golden	CO		
Scott; James Floyd	Boulder	CO		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Superconducting Core Technologies, Inc.	Denver	CO			02
University Research Corporation	Boulder	CO			02

APPL-NO: 08/480164 [PALM]
DATE FILED: June 7, 1995

PARENT-CASE:
This is a divisional of application Ser. No. 07/983,632, filed Dec. 1, 1992, (now U.S. Pat. No. 5,472,935)

INT-CL-ISSUED: [06] H01B 12/02, H01G 7/06

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	H01 G 7/00	20060101
CIPS	H01 Q 1/36	20060101
CIPS	H01 Q 3/00	20060101
CIPS	H01 P 7/08	20060101

CIPS H01 Q 3/44 20060101
CIPS H01 G 7/06 20060101
CIPS H01 P 1/18 20060101

US-CL-ISSUED: 505/210; 505/700, 505/701, 505/866, 333/74C, 333/99S, 361/281, 361/321.1
US-CL-CURRENT: 505/210; 333/24C, 333/99S, 361/281, 361/321.1, 505/700, 505/701, 505/866

FIELD-OF-CLASSIFICATION-SEARCH: 333/24C, 333/161, 333/99S, 361/277, 361/281, 361/322, 361/321.1, 505/210, 505/700, 505/701, 505/866
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
3365400	January 1968	Pulvari	361/281
3569795	March 1971	Gikow	361/321.1 X
3784937	January 1974	Jackson et al.	333/24C
4161766	July 1979	Castleberry et al.	361/281 X
4837536	June 1989	Honjo	333/247
5070241	December 1991	Jack	250/336.2
5105200	April 1992	Koepf	343/700MS
5142437	August 1992	Kammerdiner et al.	361/321.1
5146299	September 1992	Lampe et al.	361/321.1
5208213	May 1993	Ruby	505/1
5212463	May 1993	Babbitt et al.	333/161
5307033	April 1994	Koscica et al.	333/161
5409889	April 1995	Das	505/210

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0193816	February 1990	JP	
0205904	September 1991	JP	
1177869A	September 1985	SU	
1224868A	April 1986	SU	
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OTHER PUBLICATIONS

Ramesh, et al., "Feuoelectric PbZr.sub.0.2 Ti.sub.0.2 Ti.sub.0.8 O.sub.3 Thin Films on Epitaxial Y-Ba-Cu-O" (Oct. 5, 1991).
McAvoy, et al., "Superconducting Stripline Resonator Performance" Proc. 1988 Applied Superconductivity Conf.
Jackson, et al., "A High Temperature Superconductor Phase Shifter", Dec. 1992, Microwave Journal.

Bowling et al., "Radiation Efficiency Measurements of a Thin-Film Y-Ba-Cu-O Superconducting Half-Loop Antenna at 500 Mhz", IEEE, No Month, 1991, pp. 1243-1246.

Takemoto et al., "Microstrip Resonators and Filters using High-TC Superconducting Thin Films on LaA10.sub.3 ", IEEE No Month, 1991, pp. 2549-2552.
Kobayashi et al., "Monolithic HTS Microwave Phase Shifter and Other Devices", No Month, 1992, pp. 419-424.
White et al., United States Statutory Invention Registration No. H1079, filed Feb. 25, 1992, Published Jul. 07, 1992.
Jackson et al., Novel Monolithic Phase Shifter Combining Ferroelectrics And High Temperature Superconductors, Microwave And Optical Technology Letters, vol. 5, Nov. 14, Dec. 20, 1992.
Takemoto-Kobayashi, et al., Monolithic High-Tc Superconducting Phase Shifter at 10 GHz, 1992 IEEE MTT-S Digest.
Jackson et al., Monolithic HTS Microwave Phase Shifter and Other Devices, Journal of Superconductivity, vol. 5, Nov. 4, 1992.
Walkenhorst et al., Dielectric properties of SrTiO.sub.3 thin films used in high T.sub.c Superconducting Field-Effect Devices, Appl. Phys. Lett. 60 (14), 6 Apr. 1992, American Institute of Physics.
Varadan et al., Ceramic Phase Shifters For Electronically Steerable Antenna Systems, Microwave Journal, Jan. 1992.
Dinger et al., A Survey of Possible Passive Antenna Applications of High-Temperature Superconductors, IEEE Transactions on Microwave Theory and Techniques, vol. 39, Nov. 9, Sep. 1991.
Dinger et al., Radiation Efficiency Measurements of a Thin-Film Y-Ba-CU-O Superconducting Half-Loop Antenna at 500 MHZ, 1991 IEEE MTT-S Digest.
Track et al., Investigation of an Electronically Tuned 100 GHz Superconducting Phase Shifter, 1991 IEEE.
Ryan, Paul A., High-Temperature Superconductivity for EW and Microwave Systems, Journal of Electronic Defense, May 1990.
Das, S.N., Ferroelectrics For Time Delay Steering Of An Array, Ferroelectrics, 1973, vol. 5.
Scott et al., Microstructure-Induced Schottky Barrier Effects in Barium Strontium Titanate (BST) Thin Films For 16 and 64 MBIT Dram Cells, Sep. 1992 IEEE.

ART-UNIT: 252

PRIMARY-EXAMINER: Lee; Benny T.

ATTY-AGENT-FIRM: Sheridan Ross P.C.

ABSTRACT:

The present invention relates to a tuneable fringe effect capacitor for conducting radio frequency energy. The capacitor includes a thin film of ferroelectric material, a pair of films of a conductive material deposited on the ferroelectric film with a gap between the films, and a substrate for the ferroelectric material and the conductive films. The capacitance value across the gap is varied by applying a voltage to the ferroelectric material and thereby altering the dielectric constant of the ferroelectric material.

23 Claims, 24 Drawing figures

☐ 2. Document ID: US 20030222731 A1 Relevance Rank: 58

L6: Entry 1 of 6 File: PGPB Dec 4, 2003

PGPUB-DOCUMENT-NUMBER: 20030222731
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030222731 A1

TITLE: DUAL-MODE BANDPASS FILTER WITH DIRECT CAPACITIVE COUPLINGS AND FAR-FIELD SUPPRESSION STRUCTURES

PUBLICATION-DATE: December 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Raihn, Kurt F.	Goleta	CA	US
Hey-Shipton, Gregory L.	Santa Barbara	CA	US
Hernandez, Matthew	Santa Barbara	CA	US

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
SUPERCONDUCTOR TECHNOLOGIES, INC.				02

APPL-NO: 10/159974 [PALM]
DATE FILED: May 29, 2002

INT-CL-PUBLISHED: [07] H01P 1/203

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	H01 P 1/203	20060101
CIPS	H01 P 7/08	20060101
CIPS	H01 P 1/20	20060101

US-CL-PUBLISHED: 333/99.00S; 333/202, 333/219, 505/210
US-CL-CURRENT: 333/99S; 333/202, 333/219, 505/210

REPRESENTATIVE-FIGURES: 6

ABSTRACT:

A dual-mode resonator comprises a dielectric substrate having a region divided into four quadrants, and a ring resonator forming quadrangularly symmetrical configurations within the four quadrants of the region. The symmetrical configurations may be formed from folded sections of the resonator, so that parallel lines with opposite currents that cancel to minimize the far-field radiation of the filter structures. The symmetrical configuration can also be meandered, so that opposite currents in parallel line segments within each meander and the line segments that interconnect the meanders cancel to minimize the far-field radiation of the filter structures. One resonator can be used in a two-pole dual-mode filter structures, or multiple resonators can be used in more complex

dual-mode filter structures. The filter structures also include input and output couplings with capacitors and transmission lines that directly connected to the resonator to provide a point of contact, which more accurately represent ideal lumped element capacitor connections from computer modeling.

☐ 3. Document ID: US 6700459 B2 Relevance Rank: 57

L6: Entry 2 of 6 File: USPT Mar 2, 2004

US-PAT-NO: 6700459
DOCUMENT-IDENTIFIER: US 6700459 B2

TITLE: Dual-mode bandpass filter with direct capacitive couplings and far-field suppression structures

DATE-ISSUED: March 2, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Raihn; Kurt F.	Goleta	CA		
Hey-Shipton; Gregory L.	Santa Barbara	CA		
Hernandez; Matthew	Santa Barbara	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Superconductor Technologies, Inc.	Santa Barbara	CA			02

APPL-NO: 10/159974 [PALM]
DATE FILED: May 29, 2002

INT-CL-ISSUED: [07] H01P 1/203, H01B 12/02

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	H01 P 1/203	20060101
CIPS	H01 P 1/20	20060101
CIPS	H01 P 7/08	20060101

US-CL-ISSUED: 333/99S; 333/202, 333/219, 505/210
US-CL-CURRENT: 333/99S; 333/202, 333/219, 505/210

FIELD-OF-CLASSIFICATION-SEARCH: 333/202, 333/219, 333/205, 333/99S, 333/210, 333/204, 333/134, 333/212, 333/219.1, 505/210
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4642591	February 1987	Kobayashi	333/227
5078621	January 1992	Nishikawa et al.	439/581
5336112	August 1994	Michishita et al.	439/581
5638037	June 1997	Kurisu et al.	333/202
5708404	January 1998	Kurisu et al.	333/202
5786303	July 1998	Mansour	333/99S

OTHER PUBLICATIONS

Schornstein, S. et al. "High Temperature Superconductor-Shielded High Power Dielectric Dual-Mode Filter for Applications In Satellite Communication" 1998 IEEE MTT-S International Microwave Symposium Digest, New York, NY, IEEE, vol. 3, pp1319-1322.*
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Curtis, J.A. et al., "Dual Mode Microstrip Filters", Applied Microwave, Fall 1991, pp. 56-93.
Hammond, R.B. et al., "Epitaxial T/2CaBa2Cu2O8 Thin Films With Low 9.6 GHz Surface Resistance at High Power and Above 77K", Appl. Phys. Lett. 57 (8), Aug. 20, 1990, pp. 825-827.
Hejazi, Z.M., "Compact Dual-Mode Filters for HTS Satellite Communication Systems", IEEE Microwave and Guided Wave Letters, vol. 8, No. 8, Aug. 1996, pp. 275-277.
Hong, J.S. et al., "Recent Advances in Microstrip Filters for Communications and Other Applications", IEE Colloquium on Advances in Passive Microwave Components (Ref. No. 1997/154), 1997, pp. 2/1-2/6.
Jiang, Z.F. et al., "A New HTS Microwave Filter Using Dual-Mode Multi-Zigzag Microstrip Loop Resonators", 1999 Asia Pacific Microwave Conference, vol. 3, 1999, pp. 813-816.

ART-UNIT: 2817

PRIMARY-EXAMINER: Tokar; Michael

ASSISTANT-EXAMINER: Mai; Lam T.

ATTY-AGENT-FIRM: O'Melveny & Myers LLP

ABSTRACT:

A dual-mode resonator comprises a dielectric substrate having a region divided into four quadrants, and a ring resonator forming quadrangularly symmetrical configurations within the four quadrants of the region. The symmetrical configurations may be formed from folded sections of the resonator, so that parallel lines with opposite currents that cancel to minimize the far-field radiation of the filter structures. The symmetrical configuration can also be meandered, so that opposite currents in parallel line segments within each meander and the line segments that interconnect the meanders cancel to minimize the far-field radiation of the filter structures. One resonator can be used in a two-pole dual-mode filter structures, or multiple resonators can be used in more complex dual-mode filter structures. The filter structures also include input and output couplings with capacitors and transmission lines that directly connected to the

resonator to provide a point of contact, which more accurately represent ideal lumped element capacitor connections from computer modeling.

34 Claims, 29 Drawing figures

Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw D

☐ 4. Document ID: US 6130189 A Relevance Rank: 57

L6: Entry 4 of 6 File: USPT Oct 10, 2000

US-PAT-NO: 6130189
DOCUMENT-IDENTIFIER: US 6130189 A

TITLE: Microwave hairpin-comb filters for narrow-band applications

DATE-ISSUED: October 10, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Matthaei; George L.	Santa Barbara	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Superconductor Technologies, Inc.	Santa Barbara	CA			02

APPL-NO: 09/159015 [PALM]
DATE FILED: September 23, 1998

PARENT-CASE:
This application is a Continuation of U.S. patent application Ser. No. 08/668,093, filed Jun. 17, 1996, now U.S. Pat. No. 5,888,942, issued Mar. 30, 1999.

INT-CL-ISSUED: [07] H01P 1/203, H01B 12/06

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	H01 P 1/20	20060101
CIPS	H01 P 1/203	20060101

US-CL-ISSUED: 505/210; 505/700, 505/701, 505/866, 333/99.005, 333/204, 333/205
US-CL-CURRENT: 505/210; 333/204, 333/205, 333/99S, 505/700, 505/701, 505/866

FIELD-OF-CLASSIFICATION-SEARCH: 333/204, 333/205, 333/219, 333/995, 505/210, 505/700, 505/701, 505/866
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4423396	December 1983	Makimoto et al.	333/204
5055809	October 1991	Sagawa et al.	333/204 X
5616538	April 1997	Hey-Shipton et al.	333/204 X
5888942	March 1999	Matthaei	505/210

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
326498	August 1989	EP	333/205
204801	August 1988	JP	333/204

ART-UNIT: 287

PRIMARY-EXAMINER: Lee; Benny T.

ATTY-AGENT-FIRM: Lyon & Lyon LLP

ABSTRACT:

Microwave hairpin-comb filters utilize a plurality of hairpin (i.e., folded) half-wavelength microstrip or stripline resonators arranged side-by-side and all with the same orientation. The coupling regions between resonators extend parallel to the sides of the resonators for substantially 1/8 to 1/4 wavelength at the frequency of resonance of the resonators. This length of coupling region between resonators, along with all resonators being oriented in the same direction, result in resonance effects in the coupling regions between the resonators. These effects greatly reduce the couplings between the resonators so that the resonators can be very closely spaced so as to produce a compact filter structure yet still have a narrow passband. The structure can also be made to produce poles of attenuation adjacent to the passband in order to enhance the filter cutoff characteristic. The filter structure can be conveniently tuned using asymmetric dielectric pieces which rotate above an interdigital conductor pattern placed between the open ends of each resonator, the axis of rotation being normal to the substrate. This manner of tuning is particularly attractive for narrow-band, very low loss, high temperature superconductor (HTS) filters since these tuners can be made to give smooth tuning with no normal metal parts in the circuit and with no ground connections required. Such normal metal parts or ground connections would introduce considerable loss and degrade the HTS filter performance.

15 Claims, 7 Drawing figures

☐ 5. Document ID: US 6498549 B1 Relevance Rank: 56

L6: Entry 3 of 6 File: USPT Dec 24, 2002

US-PAT-NO: 6498549
DOCUMENT-IDENTIFIER: US 6498549 B1

TITLE: Dual-tuning microwave devices using ferroelectric/ferrite layers

DATE-ISSUED: December 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jiang; Hua	Mansfield	MA		
Hu; Wei	Cambridge	MA		
Liang; Shaohua	Somerset	NJ		
Li; Yi-Qun	Orinda	CA		
Fuflyigin; Vladimir	Winchester	MA		
Huang; Jiankang	Cambridge	MA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Corning Applied Technologies Corporation	Woburn	MA			02

APPL-NO: 09/457430 [PALM]
DATE FILED: December 7, 1999

PARENT-CASE:
RELATED APPLICATIONS This application claims priority from provisional application serial No. 60/111,265, filed on Dec. 7, 1998 and incorporated herein by reference.

INT-CL-ISSUED: [07] H01P 1/20, H01P 1/18

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	H01 P 1/20	20060101
CIPS	H01 P 7/08	20060101
CIPS	H01 P 1/18	20060101
CIPS	H01 P 1/203	20060101

US-CL-ISSUED: 333/202; 333/156, 333/161
US-CL-CURRENT: 333/202; 333/156, 333/161

FIELD-OF-CLASSIFICATION-SEARCH: 333/202, 333/156, 333/161
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
3661241	May 1972	Ioffe et al.	198/33

5309166	May 1994	Collier et al.	343/778
5484765	January 1996	Dionne et al.	505/210
5496795	March 1996	Das	505/210
5512196	April 1996	Mantese et al.	252/62.9
5589845	December 1996	Yandrofski et al.	343/909
5601748	February 1997	Mansour et al.	252/62.9
5635453	June 1997	Pique et al.	505/239
5650378	July 1997	Iijima et al.	505/473
5694134	December 1997	Barnes	343/700
5703020	December 1997	Das	505/210
6097263	August 2000	Mueller et al.	333/17.1
6265353	July 2001	Kinder et al.	505/238

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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07245224	September 1995	JP	
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ART-UNIT: 2817

PRIMARY-EXAMINER: Nguyen; Patricia

ATTY-AGENT-FIRM: Hamilton, Brook, Smith & Reynolds, P.C.

ABSTRACT:

A ferroelectric layer is deposited or in close proximity to a ferromagnetic ferrite layer to make a microwave substrate on which conductors can be deposited or placed to make devices. The permittivity of the ferroelectric layer can be changed by applying a voltage and the permeability of the ferromagnetic layer can be changed with a magnetic field. This makes it possible to tune the device characteristics with two different effects taking best advantage of the capabilities of each. A material example is ferromagnetic yttrium-iron-garnet on which is deposited a thin film of ferroelectric barium strontium titanate. To minimize losses, the ferroelectric film should be high quality, but practical yttrium-iron-garnet substrates are polycrystalline so that the use of buffer layers is desirable. At least two methods can be used to deposit the ferroelectric film, pulsed laser deposition and metal-organic chemical liquid deposition. A variety of dual tunable microwave devices can be made with this substrate, including by way of example only, phase shifters, frequency filters, and resonators.

19 Claims, 25 Drawing figures

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TITLE: Tunable microwave hairpin-comb superconductive filters for narrow-band applications

DATE-ISSUED: March 30, 1999

INVENTOR-INFORMATION:

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See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4578656	March 1986	La Cour et al.	333/205
4992759	February 1991	Giraudeau et al.	333/204
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ART-UNIT: 287

PRIMARY-EXAMINER: Lee; Benny T.

ATTY-AGENT-FIRM: Lyon & Lyon LLP

ABSTRACT:

Microwave hairpin-comb filters utilize a plurality of hairpin (i.e., folded) half-wavelength microstrip or stripline resonators arranged side-by-side and all with the same orientation. The coupling regions between resonators extend parallel to the sides of the resonators for substantially 1/8 to 1/4 wavelength at the frequency of resonance of the resonators. This length of coupling region between resonators, along with all resonators being oriented in the same direction, result in resonance effects in the coupling regions between the resonators. These effects greatly reduce the couplings between the resonators so that the resonators can be very closely spaced so as to produce a compact filter structure yet still have a narrow passband. For example, a compact narrow band filter structure is possible using high-Q nominally half wavelength hairpin resonators. The structure can also be made to produce poles of attenuation adjacent to the passband in order to enhance the filter cutoff characteristic. The filter structure can be conveniently tuned using asymmetric dielectric pieces which rotate above an interdigital conductor or other two conductors pattern placed between the open ends of each resonator, the axis of rotation being normal to the substrate. This manner of tuning is particularly attractive for narrow-band, very low loss, high temperature superconductor (HTS) filters since these tuners can be made to give smooth tuning with no normal metal parts in the circuit and with no ground connections required. Such normal metal parts or ground connections would introduce considerable loss and degrade the HTS filter performance.

13 Claims, 17 Drawing figures

Term	Documents
HTSC	519
HTSCS	35
(HTSC AND 5).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	6
(L5 AND HTSC).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	6

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